

LONG LASTING INSULIN DERIVATIVES AND METHODS THEREOF

BACKGROUND OF THE INVENTION

(a) Field of the Invention

[0001] This invention relates to a long lasting insulin derivative. More particularly, the insulin derivative comprises an insulin molecule and a reactive group coupled thereto, the reactive group being for covalently bonding a blood component hence generating a long lasting insulin derivative.

(b) Description of Prior Art

[0002] Insulin is a vital endocrine hormone that binds to a cellular surface receptor setting off a cascade of events culminating in glucose absorption from the blood. Impaired levels of insulin lead to severe disorders such as types I and II diabetes. Type I diabetes is a life threatening disease where the patient must daily self-administer multiple doses insulin for survival. Type II diabetes, is also a severe medical disease where the endogenous levels of insulin can no longer maintained correct levels of glycemia because the patient due to a tolerance developed by the patient to endogenous levels of insulin. In order to reduce the onset of long-term consequences, a treatment with insulin becomes necessary after failure in lifestyle changes or when traditional glycemia controlling drugs become ineffective. International Patent Application WO 95/05187 describes insulin or a functional derivative equivalent thereof which is covalently linked to a pendant molecular group, which has an affinity for a binding protein. The binding of the pendant molecular group and the binding protein is not covalent. Such binding forces may be for instance electrostatic (eg attraction of opposite charges, hydrogen bonding) or hydrophobic. Therefore, such compounds may not be appropriate for providing a long-lasting effect. Canadian Patent Application 2,363,712 relates to stimulators of insulin release. In particular, this application describes a long-lasting insulintropic compounds, which stimulates release of a patient's endogenous insulin in response to stimuli. The need that such an insulintropic compound satisfies is thus to allow or enhance release of endogenous insulin by pancreatic cells in response to

a stimuli during a long period of time. However, this document fails to teach a long-lasting insulin derivatives or a long-lasting exogenous insulin.

[0003] Success in the control of glycaemic disorder is highly related with the compliance of patients to the treatment, and reducing the frequency of injection needed is desirable. To do so, it would be highly desirable to be provided with a new long lasting Insulin derivative.

SUMMARY OF THE INVENTION

[0004] In accordance with the present invention there is provided an insulin derivative comprising an insulin molecule and a reactive group for covalently bonding a blood component.

[0005] In a preferred embodiment of the present invention, the insulin molecule is of formula I:

